

App. Ser. No. 09/651,498  
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a rotary drive motor;  
a rotary spindle coupled to said rotary drive motor;  
a heat regulating element comprising  
a regulating element frame defining a fluid inlet and a fluid outlet; and  
a fluid conduit extending from said fluid inlet to said fluid outlet, wherein  
said fluid conduit defines a substantially cylindrical heat  
regulation void, and  
said heat regulation void defines an inside diameter  
selected to accommodate an outside diameter of said rotary spindle  
and a circumferential gas flow path between said rotary spindle  
and said fluid conduit; and  
a heat regulating flange secured to said rotary drive motor, said flange comprising  
an upper surface,  
a lower surface,  
a flange body defined between said upper surface and said lower surface,  
a rotary spindle passage aligned about said rotary spindle and extending  
through said flange body from said upper surface to said lower surface,  
a fluid inlet,  
a fluid outlet,  
a fluid duct defined in said flange body and extending from said fluid inlet  
to said fluid outlet, and  
a temperature sensor positioned in thermal communication with said  
flange body proximate said rotary spindle passage.

16. A rotary spindle assembly comprising:

a rotary drive motor;  
a rotary spindle coupled to said rotary drive motor;  
a heat regulating element arranged about said rotary spindle and comprising  
a regulating element frame defining a fluid inlet and a fluid outlet; and  
a fluid conduit extending from said fluid inlet to said fluid outlet, wherein

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said fluid conduit defines a substantially cylindrical heat regulation void, and  
said heat regulation void defines an inside diameter selected to accommodate an outside diameter of said rotary spindle and a circumferential gas flow path between said rotary spindle and said fluid conduit;  
a heat regulating flange secured to said rotary drive motor, said flange comprising  
an upper surface,  
a lower surface in contact with said rotary drive motor,  
a flange body defined between said upper surface and said lower surface,  
a rotary spindle passage aligned about said rotary spindle and extending through said flange body from said upper surface to said lower surface,  
a fluid inlet,  
a fluid outlet,  
a fluid duct defined in said flange body and extending from said fluid inlet to said fluid outlet, and  
a temperature sensor positioned in thermal communication with said flange body proximate said rotary spindle passage;  
at least one liquid source coupled to said fluid conduit and said fluid duct; and  
a controller coupled to said at least one liquid source and said temperature sensor, said controller being programmed to be responsive to a temperature signal generated by said temperature sensor.

17. A wafer processing assembly comprising:

a rotary spindle assembly comprising  
a rotary drive motor,  
a rotary spindle coupled to said rotary drive motor,  
a heat regulating element comprising a regulating element frame defining a fluid inlet, a fluid outlet, and a fluid conduit extending from said fluid inlet to said fluid outlet, wherein said fluid conduit defines a substantially cylindrical heat regulation void, and said heat regulation void defines an inside diameter selected

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to accommodate an outside diameter of said rotary spindle and a circumferential gas flow path between said rotary spindle and said fluid conduit, and

a heat regulating flange secured to said rotary drive motor, said flange comprising an upper surface, a lower surface, a flange body defined between said upper surface and said lower surface, a rotary spindle passage aligned about said rotary spindle and extending through said flange body from said upper surface to said lower surface, a fluid inlet, a fluid outlet, a fluid duct defined in said flange body and extending from said fluid inlet to said fluid outlet, and a temperature sensor positioned in thermal communication with said flange body proximate said rotary spindle passage;

a wafer support secured to said rotary spindle so as to be rotatable therewith; and

a wafer processing bowl arranged about said wafer support, said wafer processing bowl defining an exhaust gas flow profile of said wafer processing assembly.

18. A wafer processing assembly comprising:

a rotary spindle assembly comprising

a rotary drive motor,

a rotary spindle coupled to said rotary drive motor,

a heat regulating element arranged about said rotary spindle and comprising a regulating element frame defining a fluid inlet, a fluid outlet, and a fluid conduit extending from said fluid inlet to said fluid outlet, wherein said fluid conduit defines a substantially cylindrical heat regulation void, and said heat regulation void defines an inside diameter selected to accommodate an outside diameter of said rotary spindle and a circumferential gas flow path between said rotary spindle and said fluid conduit, and

a heat regulating flange secured to said rotary drive motor, said flange comprising an upper surface, a lower surface in contact with said rotary drive motor, a flange body defined between said upper surface and said lower surface, a rotary spindle passage aligned about said rotary spindle and extending through said flange body from said upper surface to said lower surface, a fluid inlet, a fluid outlet, a fluid duct defined in said flange body and extending from said fluid

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inlet to said fluid outlet, and a temperature sensor positioned in thermal communication with said flange body proximate said rotary spindle passage;  
at least one liquid source coupled to said fluid conduit and said fluid duct;  
a controller coupled to said liquid source and said temperature sensor, said controller being programmed to be responsive to a temperature signal generated by said temperature sensor;  
a wafer support secured to said rotary spindle so as to be rotatable therewith; and  
a wafer processing bowl arranged about said wafer support, said wafer processing bowl defining an exhaust gas flow profile of said wafer processing assembly, wherein dimensions of said circumferential gas flow path between said rotary spindle and said fluid conduit are selected to avoid substantial degradation of said exhaust gas flow profile.

21-32. (Cancelled)

33. A rotary spindle assembly as claimed in claim 16 wherein said at least one liquid source comprises a single liquid source coupled to said fluid conduit and said fluid duct.

34. A rotary spindle assembly as claimed in claim 16 wherein said at least one liquid source comprises a first liquid source coupled to said fluid conduit and a second fluid source coupled to said fluid duct.

35. A rotary spindle assembly as claimed in claim 16 further comprising an additional temperature sensor coupled to said rotary spindle assembly, wherein said controller is coupled to said additional temperature sensor and is programmed to be responsive to a temperature signal generated by said additional temperature sensor.